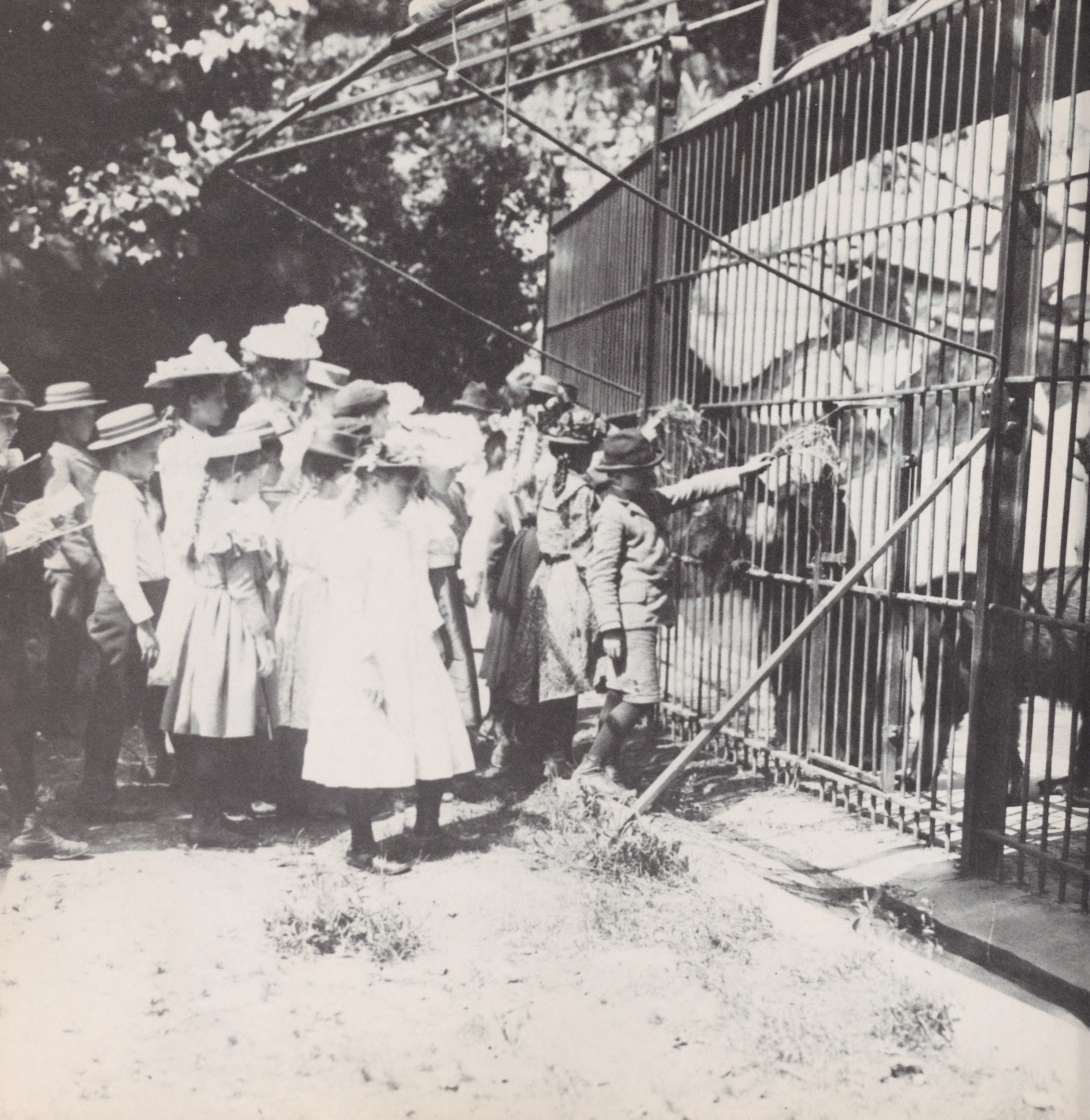
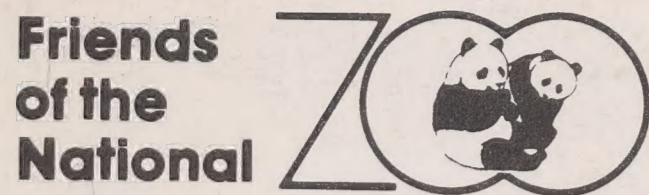




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FRONT COVER: The South American red brocket prefers to spend its day hiding in thick brush, coming out to feed at night; so the Zoo provides a thicket for it to hide in.

PAGE TWO: At the turn of the century feeding the bears was a popular zoo pastime. It was not then clear that junk food and sweets would hurt animals as much as people.

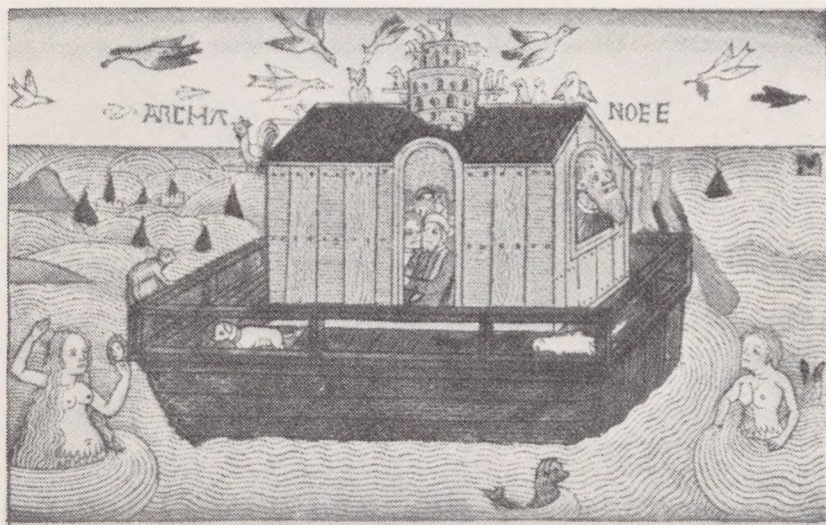
Zoos Through the Ages

Peter Muller

Humans have long been keepers of animals, and in most cases the relationship is easy to understand. Dogs provide companionship and take part in the hunt. Goats, fowl, and cattle provide food and materials. Even where life is hard, people will keep birds or small mammals as pets, and this too is understandable.

But from a very early time, people have kept near them other, more exotic animals, some of which are actively dangerous. Their reasons are hard to understand, and can only be explained by plumbing some vague, mysterious corner of the human psyche.

The hunting peoples of ice-age Europe captured wild animals and used them in their religious rites. The bear in particular was a creature of power and mystery to them, and as an important source of food as well as a deadly ad-



If a zoo is a collection of animals brought together to preserve endangered species—then Noah's ark was the first zoo!

PETER MULLER is a Washington-based writer who frequently writes about animals.

versary, it held a preeminent place in their spiritual lives. A similar pattern of worship and sacrifice appears in historical records from all over the world. The profuse animal imagery in ancient art attests to the universal belief in animal spirits.

The religious impulse is only part, however, of our emotional involvement with wild animals. Today few of us keep exotic animals in our homes, but our fascination with them remains deep. Zoos exist to satisfy this mysterious need, one of humanity's most lasting preoccupations.

To find the origin of zoos, we must look to the privileged classes in history, since only the wealthy could afford to maintain large numbers of animals simply for amusement. The concept of a *public* collection of animals is quite recent.

The fate of collections of exotic animals seems to have fluctuated with the tides of civilization. The pharaohs had menageries, as did the Chinese emperors.

Of the ancients, Alexander the Great probably came closest to practicing a modern zoo philosophy. From each land he conquered, he exacted a tribute. The tribute often included exotic animals, such as monkeys and bears, which he then maintained in captivity. He even had his tutor, Aristotle, study them.

When the Roman legions returned from a great triumph, they would parade through the streets to show off newly captured slaves and animals. Some of these animals found their way

into the arena, where Roman rulers, in their constant search for ways to amuse a jaded public, staged savage spectacles, pitting animals against each other, armed gladiators, and even hapless Christians. Lions, tigers, and elephants died in the arenas, and so possibly did polar bears and aurochs, the great wild oxen of Europe—now extinct.

Even as the spectacles went on, private menageries became a fad among Roman nobles. Many villas boasted collections of monkeys or exotic birds.

The fall of Rome temporarily ended this fad. But as European culture developed in the Middle Ages, so did the preoccupation of the upper classes with the keeping of wildlife.

Medieval nobility seems to have been characterized as much by its lust for the hunt as anything else. Every self-respecting king had his hunting preserves, sometimes carefully stocked with his favorite game.

The animals reserved for the hunt were not the same as those whose beauty or evocative character earned them a daily ration and shelter under a royal roof. European princes felt the lure of the exotic as much as the Romans did.

From ancient times, the possession of exotic animals was seen as a kind of decorative wealth—what we would call conspicuous consumption. This satisfied a vanity—a taste for the opulent and outlandish. To possess exotic animals showed the ability to



Menageries such as the one in this artist's conception were once a fad among wealthy Romans.

reach out over long distances, to snatch sometimes large and dangerous living things from their native soil and to transport them to one's own back yard. It showed that one had the power to give extravagant gifts and was worthy of receiving them as well. The symbolic characteristics of animals that had inspired religious stirrings in earlier times were not lost on medieval minds either; only think of the imagery of such names as Coeur de Lion or Dracula (Romanian for "dragon").

Exotic animals were known in Europe as early as the eighth century

A.D. Charlemagne had a pet elephant in his collection. Marco Polo returned from the East to tell of a wonderful menagerie at Shang-tu, or Xanadu, the legendary city of Kublai Khan.

The English royalty maintained a collection of exotics at the Tower of London. Unfortunately, the English monarchs were not content merely to collect. Like the Romans, they staged combats, pitting bears against dogs or lions against tigers.

By the thirteenth century menageries were widespread throughout Europe. Some popes even kept them in the Vatican.

During the Renaissance, menageries in some cities assumed a civic importance. Amsterdam, an independent city, had a lion house that symbolized its freedom. Lorenzo de' Medici improved immensely on Florence's collection.

The increasing presence of exotic species in Europe symbolizes its expansion—philosophically and territorially—into previously unknown parts of the world. As Europeans prevailed over more primitive peoples in Africa, Asia, and the Americas, wealth came streaming back as spice, gold, and strange beasts.

If captive animals were the playthings of the aristocracy, this did not mean that common people never saw them. In northern Europe, for example, performing bears were led from town to town to make a living for their keepers. Until the nineteenth century, the precedent for the public viewing of strange animals was set by itinerant performers, traveling sideshows, gypsy caravans, and such little circuses as could acquire a camel, an elephant, or some big cats.

The populace was, of course, far easier to amaze in those pre-TV days. For most people, seeing an elephant or a giraffe was a momentous occasion.

Credit for founding the first recognizable zoo should probably go to Louis XIV of France, who built an elaborate menagerie on the grounds of Versailles that lasted, despite waning interest in it, for a hundred years. When the French revolution came, the mob stormed Versailles and sacked the menagerie. The few surviving animals



Bear-baiting was a popular, if cruel, entertainment of the Middle Ages.

were sent to the Jardins des Plantes in Paris in 1793.

The Jardins des Plantes had previously been dedicated to botanical studies, but its directors accepted the animals anyway. Soon animals from other looted estates ended up there as well. The newly augmented Jardins became so popular that Sir Stamford Raffles was inspired to found a similar garden in London in 1824 which was also an immediate success.

The era of the great private menageries was over. There was a new popu-

list mood in the air and an intense new curiosity about natural history.

During the nineteenth century almost every major European city built a zoo. The guiding sentiment was a nice blend of scholarly interest in natural history and the desire for a pleasant place of public amusement. Some zoos were municipal projects; others were financed privately by shareholders.

From the outset these zoos were ambitious. A number of them combined aquariums or greenhouses with their animal exhibits. The Marseilles zoo had an art museum. Several had history museums. The zoo in Liège maintained a school of horticulture; the Amsterdam zoo had an anthropological exhibit.

The amusements that were offered varied as well. There were elaborate restaurants, concert halls with staff orchestras, and theaters. The Antwerp zoo had a billiard parlor and model dairy. German zoos sported tennis courts and a gymnasium. The Copenhagen zoo staged performances by trained dogs, and the Rotterdam zoo had fireworks every year on the Queen's birthday.

The commercial enterprises of the old zoos would have dwarfed the average zoo gift shop today. At the Jardin d'Acclimatation in Paris one could buy puppies, fattened poultry, trout, and salmon. Other zoos sold potted plants, guinea pigs, and exotic birds.

Architecturally the zoos were often

In 1835 the London Zoo was a pleasant place to socialize among and admire elephants, camels, and ostriches.

fanciful, with the designer attempting to match the style of a structure to the country from which the animal came. At the Berlin zoo, the elephant house looked like a pagoda, while the deer lived in a rustic log house—apparently to reflect the northern environment that species came from. Many zoos had fountains, artificial waterfalls, grottoes, and pools.

The nineteenth century, the great building era of zoos, also saw the birth of a modern zoo philosophy. The royal menagerie in England seems to have bred lions successfully; another zoo managed to propagate some giraffes.

Then at the beginning of the twentieth century, two men wrought changes in the zoo world that altered forever the philosophy and practice of animal care.

Chalmers Smith, at the London Zoo, was concerned about the high death rate of the animals in his care. Zoo-

keepers for years had assumed, wrongly, that tropical species needed intense, uniform heat to survive.

Despite dire predictions from his colleagues, Smith turned off the heat and opened the tropical animals' doors to the outside—even in winter. To many people's astonishment, the death rate dropped and the animals' health improved. The animals became more active, and winter visitors could see big cats playing in the snow.

As time has shown, nearly all species from warm climates adapt well to colder weather and are far healthier when they can have fresh air and exercise than when they are kept in cramped, overheated quarters.

The other zoo revolutionary was Carl Hagenbeck, whose father started an animal-collecting business. Hagenbeck the younger continued the business and at one point owned more animals than any zoo in the world. He



sent collecting expeditions to remote parts of the globe or went himself. By selling his exotic catches to zoos, he greatly expanded the variety of animals on view to the public.

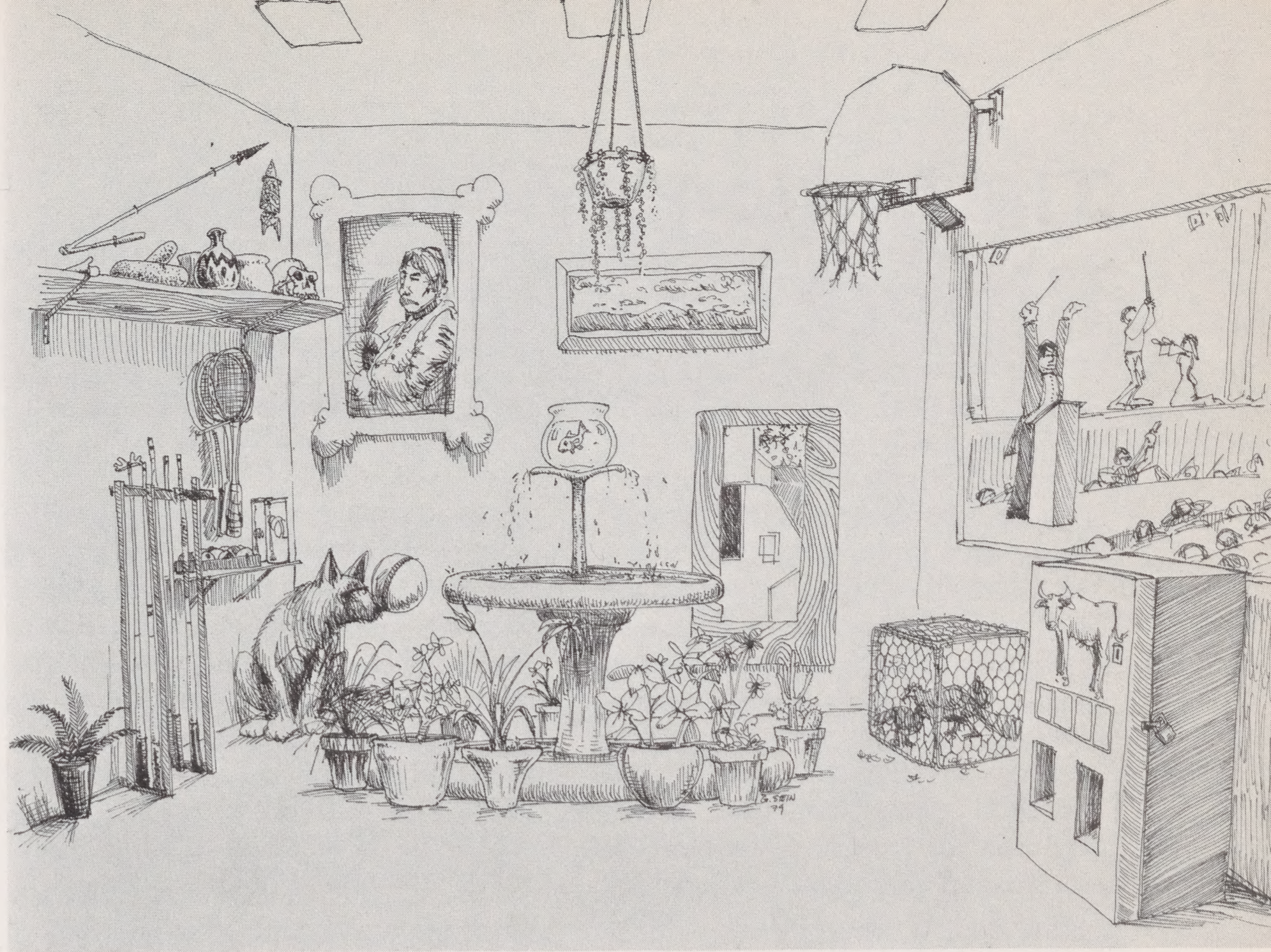
Hagenbeck is said to have known more about the habits of exotic animals than anyone then alive. In 1907 he put his vast knowledge to admirable use by building a revolutionary zoo at Stellingen, Germany—a zoo that utterly transformed the concept of containing and displaying animals.

The animals at Stellingen were put in spacious enclosures that allowed them to behave more naturally. Gone were the bars, the cages, and the boredom.

American cities joined in the nineteenth century's zoo-building spree. Philadelphia was first; other cities followed. The National Zoo was begun in 1889 by an act of Congress. It had little money for building and none for acquiring animals. It started its collection with animals that had originally been kept at the Smithsonian Institution.

As time passed the National Zoo received donations from traveling circuses: mangy tigers, castoff lions, and an elephant. The time came when the Zoo was able to mount a privately-financed expedition to collect specimens. From that point its history might be said to have properly begun.

Today the purpose of zoos has altered yet again. Our shrinking environment and the danger many species are in have turned zoos from entertainment to conservation. Breeding of endangered species has become very important, giving rise for example to the National Zoo's Con-



Nineteenth-century zoos offered every thing from concerts to gymnasia—as well as exotic animals.

servation and Research Center in Front Royal, Virginia.

Today's zoos are less like amusement parks than those of the last century, but they offer a more substantial satisfaction.

The public today is more sophisticated. We can see lions, tigers, camels, giraffes, elephants, etc., on television without ever leaving home. These animals will still, as always, be among the most beloved in our zoos; but now when we go to zoos, we can go beyond the most popular animals and see more of the rich and subtle variety of animal life.

A walk through a modern zoo shows us not only variety, but also how nature has designed her creatures to survive by different means in different

places. Zoo people invest enormous amounts of research, thought, and talent into designing exhibits and programs to dramatize our bond with nature.

Like our ancestors, we are drawn to animals instinctively. It is only the motives and ends of our animal-keeping that have changed as civilization has evolved.

Nowadays people might say we have outgrown our mystical feelings about animals. But if you have ever been fascinated by the grave, sentient gaze of a gorilla or marvelled at the power surging in the limbs of a tiger, you may wonder if we have come very far from the days when wild animals were endowed with divinity. □

The National Zoo: Historical Highlights

August 10, 1846—Congress founded the Smithsonian Institution. By 1855 animal gifts to the Smithsonian were such a burden that Secretary Joseph Henry gave a number of them to the U.S. Insane Asylum (now known as St. Elizabeth's), because "as a source of harmless amusement to the patients of an insane asylum, a collection of living animals has no equal."

March 2, 1889—Congress founded the National Zoo "for the advancement of science, and the instruction and recreation of the people." **April 30, 1890**—Congress placed the Zoo under the direction of the Smithsonian.

June 15, 1890—94 mammals, 61 birds, 5 snakes, 3 Galapagos tortoises, 17 alligators, 1 bullfrog, and an undisclosed number of water turtles were loaded onto one borrowed wagon and moved to the Zoo.

1892—The first permanent Zoo structure, a large animal house, was built.

1926-1929—Around this time, NZP Director William Mann taught a mynah bird a few phrases and a wolf whistle. The bird is reported to have said to H.M. Lord, the director of the Bureau of the Budget, "How about the appropriation?" When the director indignantly replied, "That's impertinent!", the bird shot back, "So's your old man!" The exchange netted the Zoo an extra \$30,000.

1931-1941—Public Works Administration funds built the Reptile House, the Elephant House, the Small Mammal House, the Mane Restaurant, and the shop areas.

1931-1939—The Public Works of Art Project provided jobs for thousands of unemployed artists during the Depres-

sion and created some remarkable Zoo artwork.

July 27, 1950—Smokey Bear arrived at the National Zoo.

Spring 1958—FONZ was formed "to support the aims of the National Zoo. . . particularly in helping to maintain and increase its status as one of the world's great zoos; to foster its use for education, research, and recreation; to increase and improve its facilities and collections; to advance the welfare of its animals; and to increase public appreciation of its problems and needs."

December 1960—Mohini Rewa, the great white tigress, was brought to the Zoo.

February 1, 1965—The renovated Bird House was opened to the public. This marked the beginning of the Zoo's rebuilding program.

April 16, 1972—Hsing-Hsing and Ling-Ling, our famous giant pandas, arrived at the Zoo.

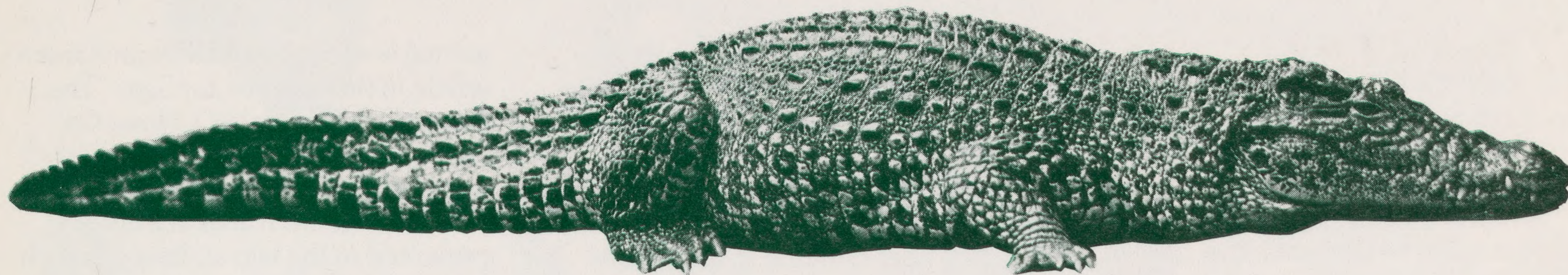
Spring 1974—The Zoo opened its Conservation and Research Center in Front Royal, Virginia; its goal is to study and preserve endangered species of mammals and birds.

May 25, 1975—The William M. Mann Memorial Lion-Tiger Exhibit was opened to the public.

May 4, 1979—The renovated Beaver Valley was opened to the public. □



The Smithsonian museums were not designed to display *live* animals—so many of its larger early donations, like these bison, ended up on the Mall.



That's Entertainment!

Jaren Horsley

The afternoon's quiet is broken by the sound of parting branches. A few leaves fall from a rubber tree and settle on the warm water of the pool. This is enough to bring up the heads of the large Cuban crocodiles lying on the bank, and instantly they bolt for the water. Like swamp ghosts, they lurk under its shimmering surface, waiting.

They don't wait long. There is a faint snap of twigs, and in unison the crocs are up and swimming frantically to the side of the pool. Someone is coming.

A blonde woman appears and stands at the edge of a short rock ledge. The twelve-foot crocodiles gather at the wall beneath her feet. With jaws open and snapping, the crocs seem ready to tear her to shreds. Is this some human sacrifice? Are we about to witness a hideous suicide in some steamy tropical outpost? Does Edgar Rice Burroughs write for *ZooGoer*?

JAREN HORSLEY came to the Zoo in 1969 and became general curator in 1972. Today involved with the administrative management of animal programs, he has lost none of his enthusiasm for zoological dramaturgy.

Actually, no. The crocodiles seem more interested in the bucket the woman carries than in tearing her limb from limb. This stainless steel container is full of chicken parts, a far more appetizing food for a crocodile than any human.

The woman wears a brown uniform. She is a zookeeper. We're not in the jungle at all, or even in the tropics. Instead, we're in a zoo; it's feeding time.

The keeper speaks lovingly to the crocodiles, calling each by name. She tosses pieces of chicken into each animal's mouth, making sure each gets its fair share, while explaining to us that Cuban crocodiles are rare—unique to that nation. She gives us a few vital statistics about their sizes, how to tell males from females, and how crocodiles are disappearing from the world. She talks about the temperaments of her charges and how each has its own personality. Crocodiles have personality? She says they do—and she ought to know.

As the bucket empties, the crocodiles settle beneath the water's surface and drift away, scraping their mouths back and forth across the bottom as they look for leftovers. The keeper reaches down and scratches the back of a seven-footer. Someone asks, "Why

The rare Cuban crocodile—and an unusual farm that breeds them—are some of the wildlife highlights of a FONZ safari to Cuba in January, 1980 (for details call 232-7700).

doesn't it bite you?" She answers that normally crocs are aggressive animals, but this one just likes to be rubbed.

We ask her about how she became a keeper and what it's like working with such dangerous animals. She laughs and tells us that working with crocodiles is less dangerous than being a carpenter. She says that she likes working with reptiles and has never considered them threatening. In fact, she has often felt that she likes reptiles better than people.

She walks with us along a catwalk and up through the densely planted fig trees. She tells of the times the zoo has tried to keep birds in this beautiful simulated rain forest. It never works: the crocs keep catching the birds when they come down to the water to drink.

After about 30 minutes we reach the exit, thank her for the show, and leave. I don't know about the others, but I was fascinated. For once the crocodiles seemed almost human.

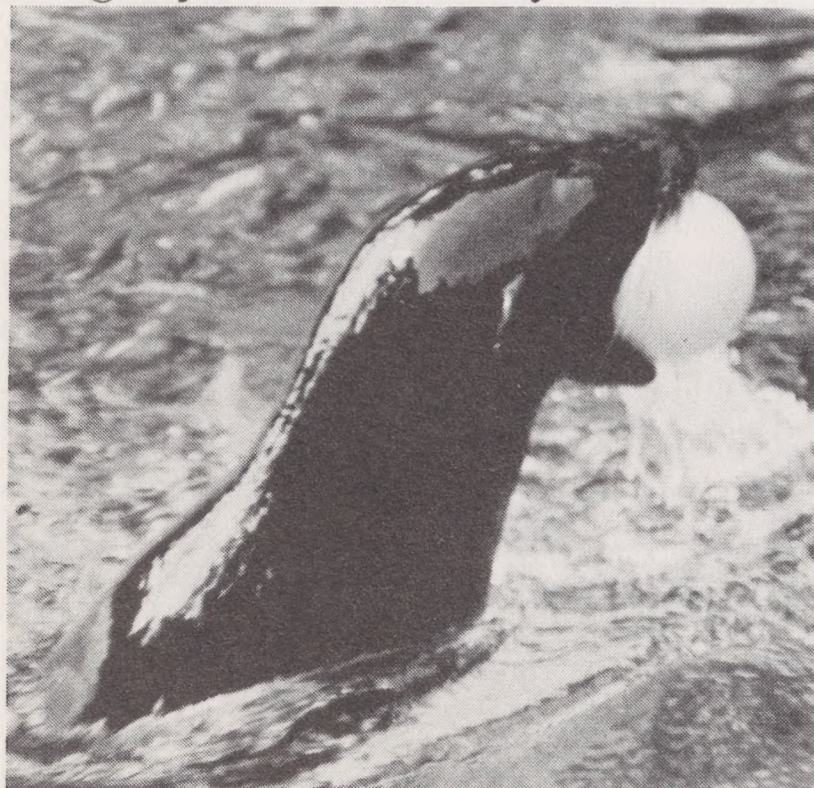
□ □ □

This is a scene that can actually take place in any zoo. It is an example of how the zoo can function as a form of theater.

What is theater? First, a theater is a place where the dramatic occurs. In this sense Shea Stadium is a theater; so is the front of the White House. Anywhere something dramatic happens is a theater.

Drama is life itself, the action of living: conflict, pleasure, grief, beauty, survival. It is the story of relationships. It excites us and holds our attention. Watching your daughter leave on her first date is drama. A heroic rescue of a child from a fire is drama. Drama compels our attention; we learn from it and it changes our lives.

Theater is the deliberate creation of drama. It is an orchestrated simulation of life, carried out by actors, in a place designed to enhance and intensify a desired effect. So in this sense, a football game is theater: it acts out conflicts, it is exciting, it causes emotions to run high. The vicarious experience of pain and glory is known to any football fan.



And the zoo is certainly dramatic. All animals, not just humans, live, die, are born, get sick, court, breed, and raise young. They fight with each other, live alone or in groups, build homes, and get old. Many are beautiful: the tiger standing in the light of the late afternoon is one of the most impressive creatures alive. Some animals are less popular: the wood rat is loved by its mother, its curator, and the more discerning of zoo visitors. Some people think certain animals are even ugly: the alligator snapping turtle has a group of loyal friends who are sure that beauty is more than skin deep. But all are fascinating, so like us in some ways and yet not like us at all.

Zoos may have drama, but most of them only occasionally achieve good theater. There *are* times when a zoo deliberately creates a situation that has a dramatic effect, but usually a zoo's "theatrical planning" consists of deciding how to get the greatest number of species onto exhibit, the goal being to show the diversity of life to the visitor.

While to communicate nature's diversity is a noble goal, too often a zoo instead ends up with rows of cages that have nothing in them but logs, piles of fur, and signs telling the visitor there is an unusual animal somewhere in the enclosure. The diversity is just not evident.

If the diversity of nature is to be fully communicated, it must be carefully orchestrated. Form and action must be presented dramatically. Often constructing a natural habitat for the

Animals "performing" are great theater, like this sea lion mouthing a rubber ball.

animal is enough (see William Xanten's article in this issue of *ZooGoer*, "The Natural Habitat Habit"). However, zoo people must avoid putting just anything into an exhibit solely to "decorate" it. Each animal must be presented to the zoo audience in such a way that the visitor can learn to appreciate as much about the animal as possible.

The animals' dramatic impact can be simple, but it should be clear. Before a species is selected for a zoo's collection, the zoo should ask such questions as, "What do we intend to illustrate with this animal?" and "Will this animal's appearance or behavior actually be visible in a staged setting?" To continually think in terms of theatrical impact keeps us from getting sidetracked into the old habit of collecting for collecting's sake, building up large and comprehensive reserves of animals that are seldom seen. Good theater demands that the diversity of life be experienced while being entertaining.

Did someone say "entertaining"? Yes! And entertainment should be encouraged. To some zoo people the word "entertainment" conjures up images of chimpanzees in clown suits or bears on bicycles, but it means much more than that.

Zoos *are* entertaining, *are* fun, and we don't need to shy away from seeing them as such. Just because you enjoy something doesn't mean that it's unimportant. Entertainment is not necessarily frivolous; it can provide deep and meaningful lessons. It's all a question of quality.

Animals can be actors. In a high-class "scenario" that demonstrates life's diversity, there can be no fear of ex-



The Zoo's Meet-a-Reptile program uses theatrical techniques to explain reptiles and amphibians to fascinated visitors.

ploitation, because *every* animal would be brought into a zoo's collection for clearly defined reasons and there would be no arbitrary selections. A rigorous review of each species' theatrical effectiveness would leave the "bad" actors (the solitary, the nocturnal, the elusive) either back in the wild or at a conservation and research center. An animal would be on exhibit to the public only if it had some lessons to communicate to us.

Not all animals, of course, are brought to the zoo to teach us by entertaining us. Some are here because they are being studied by zoo scientists. Others are in a zoo as part of a conservation program.

However, fewer than ten percent of the animals in a zoo's collection are part of *serious* research and conservation programs. Most species are on exhibit to be seen and better understood by the zoo audience—in a way, to help educate the public.

A zoo can be overtly educational without losing its character as theater. The best teaching is always good theater, combining the drama of real life with ideas to make ideas come alive. A good teacher is an artist who conveys both facts and, subtly, feelings.

Education can be grim when it's no longer good theater. Dry facts, sanctimonious preaching, or the expectation that a zoo's audience comes to the zoo not to have fun but to be indoctrinated are all three bad theater—as distasteful as being forced to eat your greens. So for a zoo to be effective educationally, it must be good theater—a full-course, rich, and varied meal.

Deliberately seeing the zoo as a form of theater is a shift in perspective that is not difficult to accomplish and will improve the way a zoo presents itself. For example, think of the opening illustration—the crocodiles were actors, they were in a dramatic setting, and for that moment they were very alive. They created a reaction in their audience: the drama replaced fear with

a healthy respect. The point was made, the lesson learned, and so the exhibit was effective—good theater.

Drama can be created all over a zoo. At the National Zoo drama is everywhere. Our "Meet a Reptile" and "Mingle with the Monkeys" programs are both extraordinarily popular. Our sea lion and elephant trainings are also very dramatic and sure crowd-pleasers. We keep peacocks at the Zoo not because they are rare but because they put on a beautiful show, and for that reason we allow them to roam where they will. Have you ever seen anyone walk away from a \$7,000 gazelle because a few feet away on the path a \$35 peacock is fanning its tail? *We have!*

Another way for a zoo to become better theater is to involve its human actors more by encouraging even more interaction with the public. The zookeeper is one of the best windows there is into the world of wild animals

in a zoo. So are the veterinarians, the scientists, and the curators.

Capturing animals, treating diseases, and doing research projects are all great theater and highly informative; if they weren't, the public wouldn't, for example, always be asking the zoo researchers who work "on location" what they are doing and why.

But most zoo visitors (unless they read *ZooGoer!*) know little about these zoo dramas. While obviously the casual visitor cannot be involved in acquisition, do surgery, or research exotic behaviors, the visitor might, with the proper arrangements, be allowed some glimpses into the exciting world of a zoo backstage. Zoo people are as dramatic as the animals, living as they do right at the point of contact between the familiar human and exotic animal worlds.

The zoo could also build theatrical "playhouses" to supplement or replace its animal houses. Animals could be kept off exhibit, "on call," and when the "plot" of the drama called for their presence they could be wheeled, cage and all, into the playhouse until the plot changed and they were no longer needed. The actual building would be more like a gallery than a building housing a collection of animals. The running plot could shift from animal coverings to animal colorings to animal motherings, *et cetera*.

For example, a keeper could walk along a series of cages placed in sequence to show the role of reptiles

"Backstage" workers have fascinating roles in Zoo life. A keeper is one of the best windows we have into the absorbing world of the wild.

in our lives. Snakes that are normally found in our own back yards are often the most difficult to exhibit. A keeper could walk the "stage" with audience in tow, talking about each animal, explaining the habitat materials in each enclosure, and helping the audience learn about action and form while being entertained.

One of the major problems with seeing the zoo as theater, and probably a zoo's gravest error, is considering animals the exclusive province of science and education. Animals are also works of art. To learn about animals in the dramatic sense includes learning to understand their beauty as well as their habits, adaptations, and evolution. We

zoo people could benefit from this realization when we consider ways to increase our zoos' dramatic impact.

It is essential to think of the zoo as theater if zoos are to survive as an institution. Zoos do serious business, and they need to keep their audience coming back for more. If the public is entertained by quality theater, it will continue coming back and it will happily pay the costs of the zoo's complete program.

Zoos should stop shying away from the concepts of entertainment and fun. Science and wildlife have a beauty of their own to be enjoyed. Good theater captures that and conveys it to the audience. And... that's entertainment! □



The Natural Habitat Habit

William A. Xanten, Jr.

Some years ago Desmond Morris published the article, "The Naked Cage." Since then there has been much controversy in zoos over which exhibit is better, the natural habitat or the bare cage.

The "naked cage" has one big advantage. A bare concrete or tile cage with a wooden or steel shelf, a wooden nest box, or a tree limb for climbing is extremely easy to maintain, clean, and disinfect, and so is a boon to animal keepers.

But to exhibit any animal in a bare, sterile enclosure is bad for it, causing many abnormal behaviors. Stereotyped pacing, self-mutilation, and abnormal aggressiveness toward the public, the keepers, or the animal's cage-mates are all largely caused by an environment that does not allow the animal natural behavior.

Giving the animal a habitat exhibit may not cure these problems—but it certainly helps. Natural materials such as trees to climb and earth to roll and burrow in help direct the animal into other, more natural behaviors.

In most cases a truly *natural* habitat is impossible to construct. Most animals have a far larger territory than can be duplicated in a zoo. Nor is it always possible to obtain or sustain the plant life and substrata of certain species'



True-to-nature reproduction can pose problems in a habitat exhibit. Pictured,

two dorcas gazelle males compete for the favors of a female.

natural habitats. But in many cases it is possible to construct a habitat that comes close to an animal's natural environment, just in miniature.

What else makes habitat exhibits better than bare cages? First, they're far more attractive! The public enjoys an exhibit complete with plants, rocks, and logs that shows the animal to its best advantage.

Second, natural habitats help the zoologist. They lend themselves to more accurate studies of an animal's behavior, such as its feeding habits or locomotion. Because the animal feels more "at home," it will act more naturally.

Finally, natural habitats make the animals more watchable by allowing them more interaction with their environment. Ground squirrels can dig and burrow; marmosets can jump and run among tree branches; small and large cats can bury their feces. And any individual can hide from the public or its cage-mates when it needs to.

Some species of mammals cannot be exhibited in natural habitats because they are so destructive. This is particularly true of the medium-to-large primates. As Saul Kitchener remarked in an earlier *ZooGoer* ("The Great

WILLIAM A. XANTEN, JR. started at the Zoo in 1956 as a keeper in the Bird House. His more than twenty years' experience at the Zoo includes the construction of natural habitats and mixed-species exhibits for birds, reptiles, small mammals, and others.

Apes," September-October 1978), "orangs are the champion cage destroyers of all time." However, I believe that many of the problems of animal destructivity can be overcome by modern technology. Fiberglass, gunite (a fiberglass-concrete mixture), and poured concrete, for example, are three materials that can withstand most of the more powerful animals.

Not only does a well-constructed habitat exhibit offer an interesting display within a single species, but it is often possible to establish habitat exhibits that allow different kinds of animals to live together. An exhibit that contained several kinds of animals, such as a mammal, a bird, and a reptile or amphibian, all from the same geographic area, would be interesting and would take the "habitat exhibit as nature in microcosm" idea one step further.

Such an exhibit must be well planned. It would be foolhardy to mix herbivores with carnivores, even if the herbivores were not the carnivores' natural prey. However, many species can live together peacefully, especially if they are from different ecological

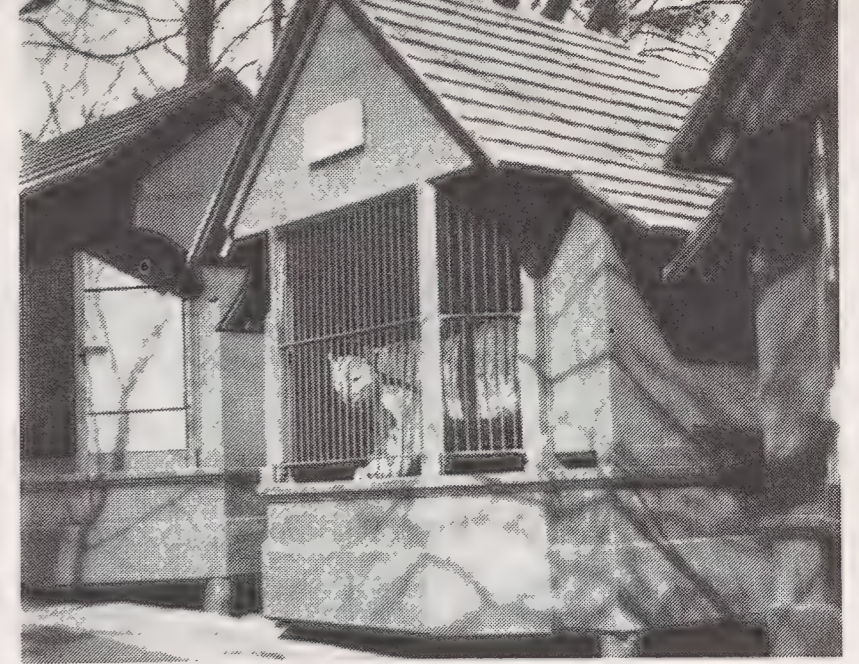
niches. For example, bush babies and African porcupines can live together quite well.

Many factors must be considered when planning a mixed exhibit. Is the exhibit large enough? Are there enough areas for retreat for all species? Can they be fed together or must they be fed separately, and if separately, where should the feeders be located? What kinds of stress will the various species undergo?

Before an exhibit is planned, known or suspected problems should be fully researched. Behavior, habitat, feeding habits, and diet will usually determine what animals can live together in peace.

Even with these known factors, many individuals within a species cannot live together and will have to be separated. In this sense every exhibit containing more than one animal is a trial-and-error experiment. Any zoo starting out in such a venture might be wise to try the more common, better-understood species first, and work up to the more involved.

Many people object to the habitat exhibit because it may result in higher



animal mortality rates. For example, putting turtles into a crocodile exhibit may result in a higher death rate for the turtles. But this problem can be overcome by the proper management, observation, and diligence of the keepers and curators. Often compatibility problems can be solved by introducing animals to the same enclosure as youngsters and allowing them to grow up together.

Heavy parasite infestation has been cited as another problem of the habitat exhibit. It is obvious that animal droppings that contain parasites or their eggs will work their way into the substrate, which is usually soil, wood chips, pine needles, or gravel, so that reinfestation becomes a problem. However, routine fecal examinations and prompt treatment if parasites are found, along with changing the substrate regularly, will greatly help to prevent reinfestation.

Another problem is the routine upkeep of the habitat exhibit, which generally falls on the keeper. All ex-



Left, a tiger stalks through its natural habitat on Lion-Tiger Hill; compare this with the dismal lioness of the turn of the century, above. Right, an eland's confinement dramatizes the barrenness of a too-small enclosure, while above right, two onagers kick up their heels in an environment as close to freedom as the Zoo's Conservation and Research Center can make it.

hibits must be cleaned of feces, urine, and food leftovers regularly. All plantings must be maintained—and cleaning a habitat exhibit calls for more than hosing out a naked cage. If the habitat exhibit is not cleaned regularly, it will have to have a complete overhaul well before the overhaul would ordinarily be needed.

However, in many species urination, defecation, and marking with scent glands are means of identifying an animal's territory. Species known to scent-mark should be allowed to do so, and these areas should not be cleaned daily—it only frustrates in the animal. This is where the habitat exhibit, though more difficult to clean than the naked cage, is handy, since a scent-marked tree or shrub is both more unobtrusive and less indignant than a visitor who has gotten the same treatment.

Hoofed animals, or ungulates, are probably the most difficult of all mammals to exhibit in habitat cages. Their sheer size requires a large environment. Most zoos use at least a third of their land for hoofed stock.

In addition, by the very nature of the hoofed stock, it is difficult to maintain plants. Trees, shrubs, and grass are prime foods for these herbivores, and unless they are protected, they are soon eaten!

Trees and shrubs can be protected by fences or wire netting. Grass, how-



ever, can be sustained only by removing the animals periodically to let the grass grow back.

To exhibit ungulates, one must first select the species. The more species shown, the less space there is to show them in. So, as with the smaller mammals, having larger exhibits with fewer species is the best policy.

Ungulate breeding, unlike that of other mammals, can be accomplished in large one-species herds or in multi-species exhibits. However, control is extremely important. Males must be introduced only when the females are most receptive and, if the zoo is in a temperate zone, to ensure that births occur during the warm months. Very few sexually active males will tolerate other mature males in the same enclosure if females are available, so extra males are usually kept in separate holding areas as back-ups.

Calving time must be closely watched so that females can be isolated. If they are allowed to calf within a herd, a close watch must be kept to prevent other animals from injuring mother or calf.

With species other than ungulates, reproduction is an area where the

habitat exhibit poses a real problem. This is especially true for the solitary species, where individuals come together only to breed, and may fight at any other time. The Zoo's giant pandas are kept apart for this very reason.

Additionally, offspring can be a difficulty in mixed-species exhibits. A mother of almost any species will protect her young ferociously, even from imaginary danger.

Therefore, habitat exhibits should primarily be educational and behavioral tools. Breeding groups can be held in back areas, and females and their young put in exhibits specifically set up to showcase mother-infant interactions.

As the public grows more knowledgeable about animals, it becomes less willing to tolerate the "naked cage." The natural habitat exhibit is not only more attractive, it is also better for the animal's mental health and improves the results of zoological research. The zoo that concentrates on sharing with the public its sense of what the animal's life in the wild is like is, I believe, the zoo for tomorrow. □





These dorcas gazelles show supreme disinterest in the potential passage to freedom that Tropical Storm David

gifted them with. Only one animal was hurt in the worst storm for the Zoo since Hurricane Agnes.

ZOO NEWS

Stormy Weather

When Tropical David stormed through the National Zoo on September 5, 1979, it arrived as just a noon downpour.

The rain pelted the exhibit areas all afternoon, with gusting winds providing moments of pause and moments of startling turbulence. There was also a good bit of flooding along Rock Creek, although it wasn't nearly as bad as when Hurricane Agnes sloshed through in 1972.

When the moment of crisis came for the Zoo, Charles Pickett, curator of birds, was outside. "It was rough," he said. "And eery. *Very eery.*"

"It was about 5:15 or 5:30 in the afternoon, and it was dark. I saw a dark gray mass come whirling through the grounds and out onto Connecticut Avenue, carrying with it thousands of leaves and small limbs from the trees. I was shaken. It was a tornado—definitely a tornado. The first one I've ever seen, and I sure hope it'll be the last!"

It was indeed a tornado. It stomped a devastating course through the Zoo, starting at the foot of Beaver Valley, whirling up the back way toward the

Bird House, and finally veering off just in time to avoid hitting the Education/Administration Building.

"We were lucky," commented Bill Xanten, curator of mammals. "The tornado could have done unbelievable damage. I still don't really understand how we escaped so lightly."

The damage was still nothing to sneeze at. Here is a list of the worst the Zoo suffered:

- Some 200 trees were blown down, blocking several roads.
- Half the ostrich yard was wiped out, and the Zoo's only casualty occurred—a female ostrich was killed

by a falling tree.

- The pelican shed was turned upside-down.
- The roof of a snowy owl's cage, #44, was smashed.
- The maned wolves' fence came down while the animals were confined for shelter in their kennel.
- Five sections of the cheetah yard fence were destroyed. Men from not only the Zoo's tree unit, but also its office of animal programs, police department, and engineering unit worked from dusk until 9:30 p.m. in the drenching rain to throw up a temporary fence.

- Telephone lines came down in five deer areas, and wires were wrapped around the antlers of one reindeer.

- Trees fell in the dorcas yard, the duiker yard, the kangaroo yard, the Panda Gardens, and on most or all of the trails.

The next day, surveying the morning after the night before, one Zoo employee summed it all up, saying sadly, "I guess it could have been worse. Only one animal was killed, or even hurt, and it's the animals that are important. But, Lord, I've never seen such a mess." □



Artist Christine Smith has contributed to Zoo beauty with these striking bas-reliefs above the sea lions' underwater viewing window in Beaver Valley.

FONZ NEWS

FONZ Summer Intern Program

For the fourth year, FONZ sponsored its successful summer intern program. Twenty students spent three months assisting in some of the Zoo's ongoing research programs, learning about the Zoo, and developing Zoo skills.

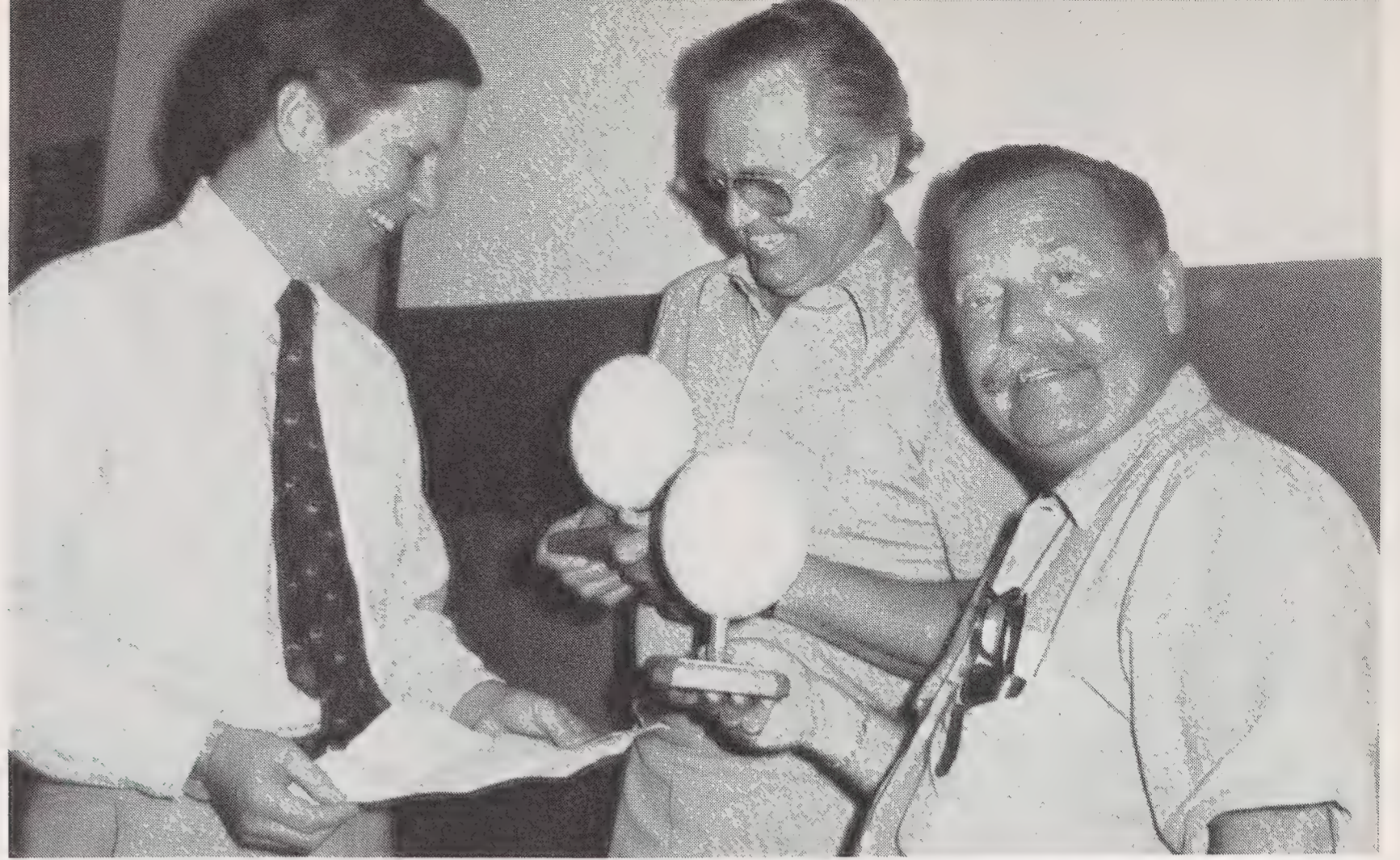
The three general areas in which the interns worked in 1979 were behavioral, husbandry, and conservation research; clinical zoological medicine or pathology; and design methodology and analysis.

The interns worked in areas as diverse as the Zoo's Office of Graphics and Exhibits and its Conservation and Research Center at Front Royal, Virginia.

The projects ranged from the study of Père David's deer and mother-baby interaction in hoofed stock to projects related to the Zoo's graphic displays.

FONZ gave each of the 20 interns a stipend of \$1,000 for his or her three months' work and offered those who worked at the Conservation and Research Center low-cost housing in the Zoo's on-site barracks.

"This is more generous than it might seem in these days of inflation," noted Mary Sawyer Hollander, the FONZ staffer who administered the program. "Many students would work for



FONZ Executive Director Sabin Robbins, left, presented the FONZ "Good Egg" Award (an ostrich egg) to Washington

broadcasters Frank Hardin, center, and Jackson Weaver, right, for their long-standing support of the Zoo.

nothing, just for the experience this program provides—I did myself when I first came to Washington!"

Katherine Ralls, a Zoo research scientist who coordinated part of the intern program, said, "Some of the interns weren't expecting Washington to be so expensive. I think if we expand the intern program in the future, we might consider providing the students with a sort of 'den mother'—someone to help them find housing and get adjusted to Washington.

"The program has been very successful," she continued. "In 1979 we advertised it nationally for the first time, and the response was tremendous. We had interns this summer from as far away as California.

"The interns had to write reports on their summer's accomplishments, and the theme that comes up over and over again is, 'I learned a lot; I had a good time.' Even the ones who decided that doing research or being a vet was not for them after all learned a lot."

Intern Margaret Welk said in her end-of-summer report, "I had a busy,

but enjoyable and informative summer as a FONZ intern. I would like to thank those people who made it possible."

FONZ D.C. Summer Bus Program

The FONZ D.C. bus program was taken into its second year this summer. In the process it was expanded and improved upon so that the program, experimental in its initial phase, became even more exciting and innovative.

Through this program FONZ brought children from eight D.C. recreation centers to the Zoo for four consecutive days to learn how to use the Zoo while having fun at the same time. Many of the children involved were from the inner city; a few had never been to a zoo before.

Two dedicated teachers, Ron McClain and Tom Yoder, coordinated

the program. They used FONZ and NZP education materials, movies, games, arts and crafts, daily walks through the Park, and their own creative imaginations to teach the nine-to-12-year-olds about the Zoo.

One activity, for example, involved dividing the children into small groups and assigning each group a specific animal to pantomime while the other groups tried to guess what the animal was. The exuberant children flopped like sea lions, shambled like elephants, and hopped like kangaroos—learning the rollicking way about animal locomotion.

On Day 1, the children got a general introduction to the Zoo in the morning and looked at the big cats in the afternoon. On Day 2, they studied birds and reptiles. Day 3 saw them mimicking mammal movement and mingling with the monkeys; Day 4 took them to Beaver Valley in the morning, while in the afternoon they had a "Treasure Hunt"—actually a quiz that revealed to McClain and Yoder just how much they'd learned.

The FONZ Zoo Express bus picked up the children each morning and returned them to their recreation centers each afternoon.

"The children left the program with a clear idea of what the Zoo is for, why it exists," McClain said. "Now they know more about what to look for when they visit the animals—it makes the Zoo more interesting."

"Helping these children learn about the Zoo was an important experience for us," Yoder said. "I think we learned as much as the children did. And they had fun." He added, smiling, "We had fun too."

"The Last Chance"

Spurred by the enormous success of its first movie, "Zoo," FONZ has sponsored a new film this year, "The Last Chance."

This 28-minute color movie highlights the behind-the-scenes activities of the Zoo's Conservation and Research Center at Front Royal, Virginia.

The film shows how the National Zoo took a 3,000-acre farm site in 1974 and transformed it into a modern-day Noah's Ark for the study and preservation of endangered mammals and birds.

The film focuses in particular on the round-the-clock research that few outsiders are privileged to see. As dawn breaks, researchers in jeeps tape and record behavior in a herd of Père David's deer, which survive today only in zoos or parks. Other scientists study South American bush dogs from observation towers, and a hawk plays a crucial role in a study to save the threatened Eastern bluebird.

Photographing "The Last Chance" at Front Royal, filmmakers captured the drama of the CRC's resident herd of

"In the future, the Front Royal Center might be more important to the total life of zoos and to conservation and the study of animals than any other single place," says Theodore H. Reed, Director of the National Zoo. "The Center gives us promise of being able to perform our welcome responsibility to act as a proper host and interpreter for fellow members of the animal kingdom. But first we must preserve their lives, so that tomorrow we can hear their voices."

"The Last Chance" was produced and directed for FONZ by Jan Skrentny/Ames Productions. It premiered on WDVM (Channel 7) on September 30, 1979.

The film will be shown regularly in the Zoo's auditorium and made available for loan or sale to schools, libraries, and other requesting organizations. For details, contact FONZ's Education Department at 232-7703. □

oryx. FONZ's new movie is available for loan or sale and is shown regularly in the Zoo auditorium.



FONZ EVENTS

Enchanted Galapagos

By popular demand the "enchanted islands" of the Galapagos will be the destination of a second FONZ cruise this spring.

On this 16-day wildlife adventure, arranged exclusively for FONZ members, participants will swim with friendly sea lions, come within arm's length of the famed giant tortoises, and watch close up the antics of land and marine iguanas. The wild birds of the Galapagos are so unafraid of humans they could perch on your shoulder!

The April 26-May 10, 1980 trip begins with four days in and around Quito, the picturesque capital of

Ecuador. There will be excursions to colorful Indian markets, a special lunch reception at a typical Ecuadorian hacienda, and an all-day ride on the unusual Autoferro (a bus on train wheels!) through remote farms and villages and over the snow-capped Andes to the Pacific-coast city of Guayaquil.

Eight days will be spent cruising the volcanic Galapagos islands, which have changed little since their wildlife wonders amazed Darwin. Island inhabitants include blue-footed boobies (birds, not people!), fur seals, flamingoes, Darwin's finches, the Galapagos albatross, sea lions, huge marine and land iguanas, and, of course, the famed giant tortoises.

Each day the comfortable cruise ship stops at a different island for hikes led by professional naturalists. Illustrated lectures each evening highlight the day's events and preview the next day's attractions.

A FONZ or Zoo leader will accompany the group. The cost of \$1,980 includes everything but some meals in

the major cities.

Because space is limited on this popular adventure, register early by contacting the Office of FONZ's Executive Director at 232-7700.

Glorious Iceland- Greenland

Where is July a cool and exhilarating month? And how can you get there to enjoy it?

Consider joining a remarkable FONZ safari to ice-cooled Greenland and Iceland!

The July 8-22, 1980 tour of the rarely visited northern reaches of the "Land of the Midnight Sun" promises a number of showstoppers: geysers and glaciers, seabirds and lava fields. There are cruises to isolated Eskimo fishing villages, and one unforgettable journey past hundreds of icebergs and across a spectacular fjord to visit the boyhood homes of Eric the Red and Leif Ericson.

The first stop will be Reykjavik, the geyser-heated capital of Iceland. Then the safari will cross lava fields and mountains to explore the black sand beaches of the southern coast. One day will be spent at Skaftafell National Park; another day will have the group watching the puffins, kittywinks, and cormorants that jam the seacliffs of Dyrholaey.

The final week will be spent in remote southern Greenland. Using the Arctic Hotel (famed for extravagantly delicious Danish food) as home base, FONZ trippers will cruise to iceberg-strewn fjords, Norse ruins, and glaciers below snowcapped mountains. At one Eskimo settlement that still uses dog



Penguins are just one of the many exotic species FONZ members will encounter on safari to the Galapagos this spring.



Waterfalls and water birds, glaciers, and geysers will be commonplace sights for FONZ travellers on the Iceland-Greenland safari in July.

sleds as transport, shoppers will be able to choose among beautiful, hand-embroidered mukluks (boots), jerkins, and intricately worked carvings. "It's just about the most remarkable and beautiful travel experience of my life," wrote one recent visitor.

As usual, local experts and a FONZ/Zoo leader will guide the expedition throughout. The estimated tour cost of \$2,171 includes everything but a few optional meals in Reykjavik.

Space is limited on this unusual adventure, so interested members should reserve space as soon as possible by calling the Office of FONZ's Executive Director at 232-7700.

Tanzanian Trek

Some of Africa's greatest game areas will be explored on a FONZ safari to Tanzania this summer.

The three-week wildlife tour (August 7-25, 1980) will concentrate on the teeming wildlife on and around the fabled Serengeti. The safari is timed so that participants will be able to witness the great migration of millions of plains animals. At Seronera, leopards are often seen; elephants and lions fill Manyara; cheetahs hunt beneath the snows of Mt. Kilimanjaro at Arusha National Park. Other highlights will include Masai warrior

dances; a special tour of Olduvai Gorge, the cradle of humanity; night game drives; and accommodations in luxury lodges and tented camps.

For insights into the daily adventures, group members will have talks with local game wardens and briefings by the FONZ/Zoo leader and local professional safari guide who will accompany them throughout.

The all-inclusive price of \$2,900 includes overnight stopovers in London. To reserve space for the Hemingway-like adventure, contact the Office of FONZ's Executive Director at 232-7700. □

Zoo Clerihews

A friend of ours recently wrote to *ZooGoer*, "Why don't you have an article that gives the pronunciations for the names of some of our less than common critters? For example, guenon, macaque, anole, Siamang, hutia, kitty, doggie, etc. This might even extend to the more exotic names, as in the pandas Ping Pong and Ding-a-ling."

We sympathize. When we first came to *ZooGoer*, not only did we not know what half those animals *were*, but we really believed the pandas were called Ping Pong and Ding-a-ling. (We were quickly disabused.)

We decided that one good way to fill our friend's request was to provide mnemonic rhymes that would give pronunciations and perhaps a few words of description. We settled on clerihews, the only light verse form that has caught on since the limerick took the town by storm.

The clerihew was invented by Edmund Clerihew Bentley at the age of 16. He wrote:

*Sir Humphrey Davy
Detested gravy.
He lived in the odium
Of having discovered Sodium.*

As Clifton Fadiman remarked, "To invent and perfect an entirely new method of biography shortly after completing one's third lustrum is to enlarge the world's conception of precocity."

Here then are a few of the Zoo's clerihews—from us to youse.

*The giant panda Hsing-Hsing
Is content to live in Washing-shing-Ton.
Though with Ling-Ling, his erstwhile mate,
He does little more than date.*

*"I admire the noble blesbok.
It's a fine antelope," says Bach.
"And the white spot on its face
Is far from commonplace."*

*The shy and delicate dik-dik
Will run from danger quick-quick;
Its tiny hooves go "clop clop"
Chop chop.*

*The Siamang gibbon
Deserves a blue ribbon:
It stays cool when by a gang
It is called Siamang.*

*The African guenon
Might rather be left alone
If it weren't a lively monkey
Instead of your average junkie.*

*The little lizard, anole,
Does not need Nupercanol;
It's both nocturnal and quiet
And there's roughage in its diet.*

*The tropical tapir
Is not a great escaper;
A fatty related to the rhino?
Damned if I know!*

*The weaverbird, or whydah,
Hid a
Nestling in its nest.
For whydahs, hiding's best.*

*The Hawaiian nene
No one should waylay—
Before you'd have blinked
This goose is nearly extinct.*

*The African civet
Has feline proclivities.
From dawn way past dusk
It's famed for its musk.*

*Comparing an ostrich to an emu
It would seem you
Just can't win. While the ostrich may
seem more fun,
Neither one can do more than run.*

*Who loves the ugly wildebeest
Will of it speak ill the least.
Otherwise known as the gnu
These cow-like beasts are few.*

*You won't find the fleas of an onager
Residing upon a cur,
Though it's one beast you can with propriety
Call a wild ass in society.*

*On observing the graceful macaque
You might be taken aback.
A simian like the rhesus
It bears no relation to Croesus.*

*Consider the Cuban hutia:
For those who see a
Rodent like the cavy—
It's gravy!*



OPPOSITE: A natural habitat is easier to create for birds, such as these ibises in the Bird Houses, than for some of the larger Zoo animals.

BACK COVER: Dramatic, naturalistic exhibits are the rule rather than the exception at the "new" National Zoo.

CALENDAR

NOVEMBER

- 11 (Sunday)
"Hippo Days Are Here Again"
18 (Sunday)
"Zoo Arts"
19 (Monday)
Audubon Lecture
"The Secret Life of Some Sea Urchins"

DECEMBER

- 2 (Sunday)
"Animal Tales"
9 (Sunday)
Christmas Tree Decorating Party
16 (Sunday)
"For Snakes' Sakes!"
17 (Monday)
Audubon Lecture
"Peregrin Falcons Recover"

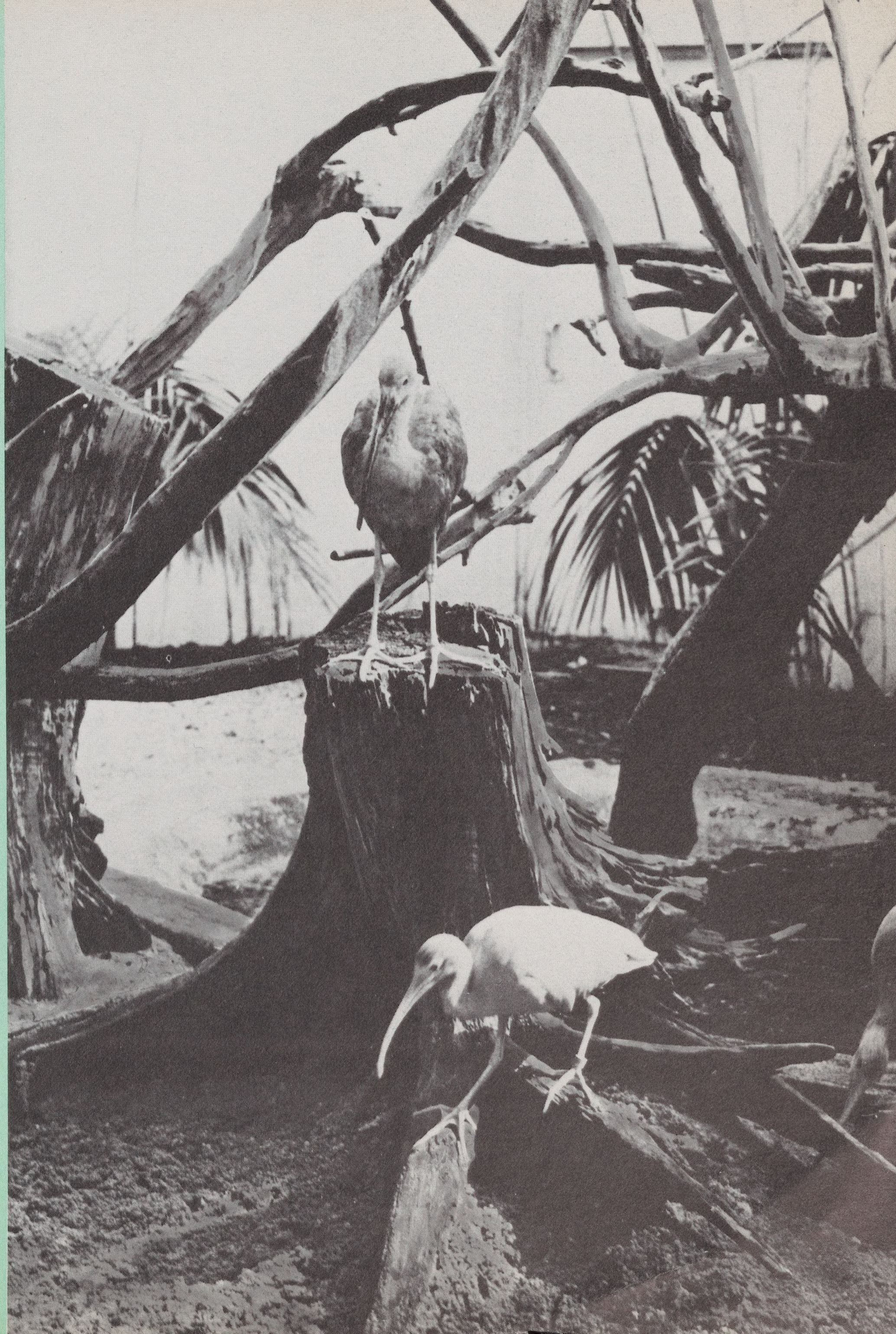
JANUARY

Photo Contest Begins

- 6 (Sunday)
"Stories of Africa"
13 (Sunday)
"Winter Trek"
20 (Sunday)
"Walk Like the Animals"
21 (Monday)
Audubon Lecture
"Two Threatened Worlds: The High Himalaya and Amazon Jungle"
27 (Sunday)
"To Fly Like a Bird"

Sunday listings are for the Zoo's new program, "Sunday Afternoons at the Zoo," free to the public.

For more information, call FONZ at 232-7700.





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